

# Training Program on

## Proteomics Approaches for Women Scientists in Life Sciences



Sponsored by



Department of Science  
& Technology (DST),  
Government of India  
New Delhi

Organized by



Department of Mycology & Plant  
Pathology,  
Institute of Agricultural Sciences,  
Banaras Hindu University  
Varanasi 221005

## **ABOUT THE TRAINING PROGRAM**

Proteomics is the study of the proteome which represents total number of different proteins present within the cell at any one time. A given cell can have one genome but that cell can have many proteomes, depending on which genes are expressed and the level of that expression at a particular point of time. Analysis of the complex protein mixtures isolated from cells therefore, presents substantial analytical challenge. While protein identification and quantification have historically been laborious procedures, often requiring relatively large amounts of material, new technologies for the sequencing and identification of proteins, particularly those involving mass spectrometry, have developed rapidly over the last few years. These developments have revolutionized protein analysis, dramatically reducing the amounts of material required, decreasing analysis times and permitting parallel throughput of large numbers of samples. Consequently proteomics is an important and rapidly evolving area of research.

Looking into the importance of the subject and need of a trained man-power in the highly specialized and technologically sound area of proteomics, Department of Science & Technology, Govt. of India has taken a lead to sponsor Training Program for the Women Scientists working in various disciplines of Life Sciences. The basic aim of this Training Program is to equip women scientists working on various aspects of plant, microbes and animal research with such specialized skills on chemical nature, behaviour, identification and functional characterization of proteins, proteome and proteomics and their linkages with the biological functions. Such a theoretical and hands-on practical training will expose women scientists with the most advanced and complex research problems of the biological systems and help them to solve the challenges of their research endeavour through the applications of recent tools, techniques and skills.

The Training Program is designed in Two Parts, the Theoretical part mostly comprising lead lectures by eminent biologists in the country and Part II which is based on Hands-on Practical Training on Methods, Tools, Techniques and Equipments for the study of proteomes. Theoretical aspects will be covered with the Introduction of the subject of proteomics leading to describing its place and importance in current biology and discussing the nature of proteomes. Practical Part will expose participants with the tools of proteomics like protein separation by two-dimensional gel electrophoresis, mass spectrometry of proteins and peptides, protein and genome sequence databases, computer software for matching mass spectral data with those of databases.

## **OBJECTIVES**

The objectives of this training program are:

1. To equip Women Scientists with hands-on practical exposure on the wet-lab proteomics and metaproteomics approaches in the life science research
2. To provide theoretical and practical knowledge about the methodologies, experimental designs, laboratory instrumentation and advanced equipments used for proteomic data generation
3. To expose participants with the data analysis tools, softwares, databases, and bioinformatics techniques used for the analysis and interpretation of protein sequence data and connecting it to biological functions

## **Training Schedule**

The duration of this Training Program is for five days in which both the Theoretical and Practical aspects of Proteomics will be thoroughly covered. A tentative schedule is as under...

Days	Theoretical Lecture and on-line exposure based training (10:00 am-1:00 pm)	Hands-on Practical Wet-Lab Training (02:00-05:00 pm)
1	Introduction to proteins : Structure, Conformation and Biological Functions	1. Standardization of protocols for isolation of proteome from various sources 2. Extraction, purification and quantification of proteome from plant and microbial sources
2.	Principles and applications of quantitative and targeted proteomics	1. Quantification of isolated proteins 2. Standardization of protein quality and quantity 3. Separation of proteins using gel electrophoresis
3.	Applications of quantitative proteomics in biology, clinical research and drug discovery	1. Preparation and protocol standardization for 2-D gel Electrophoresis of purified protein samples 2. Analysis of 2D images; Development, visualization and interpretation of chromatogram
4.	Tools and techniques in proteomics -1. Principles and applications of 2-D gel electrophoresis, DIGE and iTRAQ, MudPIT, etc. 2. Mass spectrometry and applications	1. Isolation of metaproteome directly from soil samples (practical method exposure) 2. MALDI MS/MS data analysis of differentially expressed proteins in proteome and metaproteome samples
5.	Quantitative proteomic data analysis using bioinformatics tools	1. Protein structure prediction, modeling, simulations and linking with biological networks (Dry-lab experimentation)

## TRAINING CALENDAR

**1<sup>st</sup> Training Session: 4.2.2017-8.2.2017**

**2<sup>nd</sup> Training Session: 2.3.2017-6.3.2017**

## ELIGIBILITY CRITERIA

All women scientists/women interested to pursue their career in research having Master's Degree in any branch of Life Sciences or Agriculture or equivalent Degree. Selection for the participants will be solely based on the merits of the participants and their career.

## FEE

There is NO FEE for this Training Program. AC-III train fare transport and accommodation will be provided on sharing basis.

## HOW TO APPLY

Interest women scientists / women may send their Application in the prescribed format duly forwarded by the Head of the Department/ concerned Institute. Duly filled Application should reach **Prof. Harikesh Bahadur Singh**, Head, Department of Mycology and Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221005, Uttar Pradesh on or before 20.1.2017 for 1<sup>st</sup> Training Session and 20.2.2017 for 2<sup>nd</sup> Training Session.

**TRAINING PROGRAMME**  
**on**  
***"Proteomic Approaches for Women Scientists in Life Sciences"***

1. Title    2. First Name    3. Middle Name    4. Last Name  
           

5. Date of Birth    6. Age    7. Gender    8. Marital Status  
            Married   
Unmarried

*Affix your  
recent  
passport size  
photograph  
here*

9. Nationality    10. Designation    11. Accommodation required  
        Y     N

12. Address of the Institute/Department    13. Correspondence Address (If Different)  
      
      
      
   

14. Educational Details

	Qualification	Name of University	Specialization	Total Marks Obtained(%)	Year of Passing
Ph.D.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Masters	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bachelors	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Higher Sec.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

15. Research and Teaching Experience:

19. List of the Research paper published:

16. Area of the Specialization

17. PROFESSIONAL EXPERIENCE

Years of Experience  Type of organizations worked with Academic  Research   
Private  Government

If Other (Specify)

18. Details of Professional Experience

Organization	Designation	Nature of Work	From	To	Important Projects handled

GENERAL INFORMATION

19. Please state why you are interested in this programme and what do you expect to gain from this training?

Signature

Date:

Place:

Forwarded By Head/Director

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